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The genus *Diatrype* (*Ascomycota, Diatrypaceae*) in Arkansas and Texas (USA)

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Abstract — Seven species of the genus *Diatrype* are recorded as occurring in Arkansas and Texas (USA). Two of these (*Diatrype caryae* and *D. ilicina*) are described and illustrated as new to science.

Key words — *Sordariomycetes,* south central United States, systematics

Introduction

Species of *Diatrype* are common inhabitants of dead branches of deciduous trees throughout the world. These fungi produce perithecia imbedded in discoid or widely effused stromata that are erumpent from the bark. The young stromata are sometimes covered with a layer of sterile tissue that eventually peels off to expose a fertile surface studded with papillate or stellate ostioles. Members of the genus *Diatrype* do not cause diseases of their host plants and mostly participate in the decomposition of coarse woody debris. However, despite their saprotrophic way of life, many species of *Diatrype* are restricted to certain genera of host plants.

Following the distribution of their host plants, some species of *Diatrype* occur over wide areas of the northern hemisphere. Prominent examples are *D. bullata* (Hoffm. : Fr.) Fr. on *Salix* spp. (willow) or *D. undulata* (Pers. : Fr.) Fr. on *Betula* spp. (birch). Among the more interesting are *D. virescens* (Schwein.) Ravenel on *Fagus grandifolia* Ehrh. (American beech) in North America and *D. disciformis* (Hoffm. : Fr.) Fr. on *Fagus sylvatica* L. (European beech) in Europe. The latter has been reported to be rare in North America, but the

monographer of the group (Rappaz 1987) has listed specimens only from Europe. We did not observe *D. disciformis* among specimens in any herbarium or represented by fresh material collected in North America. As such, all the records of this species in North America (Farr et al. 1989) need to be checked. With two different species of *Diatrype* on *Fagus* spp. on two continents, the third one, namely *D. decorticata,* occurs on the same hosts in both Europe and North America.

Diatrype tremellophora Ellis is restricted to *Magnolia* spp. (magnolia) in the eastern United States, as is the case for *D. atlantica* on *Quercus* spp. There are also several species known only from type localities in the United States. Examples are *D. concolor* (Schwein.) Cooke (on *Vaccinium corymbosum* L., blueberry), *D. subaffixa* (Schwein.) Cooke (on a twig of a member of the *Rosaceae*) from New Jersey and *D. bicolor* (Berk. & M.A. Curtis) Cooke (on an unidentified substrate) from Vermont. These observations give some indication of just how much remains to be done if we are to develop a more complete understanding of the true biodiversity and distribution of species of *Diatrype* in different regions of the world.

Pyrenomycetous fungi in general and members of the genus *Diatrype* in particular are poorly investigated in the south central United States. Most of the species assigned to *Diatrype,* collected in Texas and kept in the US National Fungus Collections (Beltsville, Maryland), do not belong to this genus. Thus, *D. atropunctata* is *Biscogniauxia atropunctata* (Schwein. : Fr.) Pouzar, *D. dryophila* is *Anthostoma dryophilum* (Curr.) Sacc., *D. gyrosa* is *Endothia gyrosa* (Schwein. : Fr.) Fr., *D. hypophlaea* is *Jumillera hypophlaea* (Berk. & Ravenel) J.D. Rogers & al., *D. microplaca* is *Whalleya microplaca* (Berk. & M.A. Curtis) J.D. Rogers & al., and *D. prominens* is *Cryptovalsa prominens* (Howe) Berl. The specimens of *Diatrype* sp. (BPI 577787 and 577789) on *Ilex opaca* Aiton (American holly) appear to be *Cryptovalsa opaca* (Cooke) Lar.N. Vassiljeva. As for species of *Diatrype* from Arkansas, there are four specimens of two species in the national herbarium (BPI). These are *Diatrype albopruinosa* (Schwein.) Cooke and *D. stigma* on *Quercus* spp. (oak). The occurrence of the latter species in Arkansas was confirmed by our collections, but they are all on *Carya* spp. (hickory), while *D. albopruinosa* was not found again.

Our previous paper on the genus *Diatrype* in North Carolina and Tennessee (Vasilyeva & Stephenson 2004) contains the descriptions of ten species. Only four of these—*Diatrype atlantica* and *D. stigmaoides* on *Quercus* spp., *D. decorticata* on *Fagus grandifolia* and *D. platystoma* on *Ostrya virginiana* (Mill.) K. Koch (hop-hornbeam)—were found again in two south central states, and the first three are especially frequent in the Big Thicket National Preserve. Specimens with the typical appearance of *D. platystoma* were encountered in Arkansas, but this species was essentially absent in Texas. One specimen that

is similar to *Diatrype discostoma* Cooke in Ravenel's Fungi Americani Exsiccati N 358 (in cortice *Carpini,* Gainesville, Florida) was collected in the Big Thicket. The name *D. discostoma* has been reduced to a synonym of *D. platystoma* (Rappaz 1987), but the absence of the typical form of *D. platystoma* in Texas and a record from Florida suggest that what has been recognized previously as *D. discostoma* might represent, at least at the level of variety, a separate taxon preferring a warmer climate.

Material and methods

The material considered herein was collected in 2005 (Ozark Mountains and Ouachita Mountains, Arkansas) and 2006 (Big Thicket National Preserve, Texas) by the first author. Microscopic analyses were carried out using standard techniques. The photographs were taken using Nikon D40x and Canon Power Short S40 digital cameras. Sections of stromata were photographed with a Leica MZ75 microscope.

Taxonomy

Diatrype atlantica Lar.N. Vassiljeva, Fungal Diversity 17: 193 (2004) Fig. 1

Stromata erumpent through the bark, widely effused, flat, about 1 mm thick, chocolate colored, with shallow discoid or ring-like ostioles scattered at the surface, without a black stromatic zone in the substrate. Perithecia in one or two layers, globose, 200–300 µm diam. Asci clavate, p. sp. 30–40 × 4–6 µm, with short stalks, apical ring J-positive. Ascospores hyaline, slightly curved, (6–)7–9(–10) µm long.

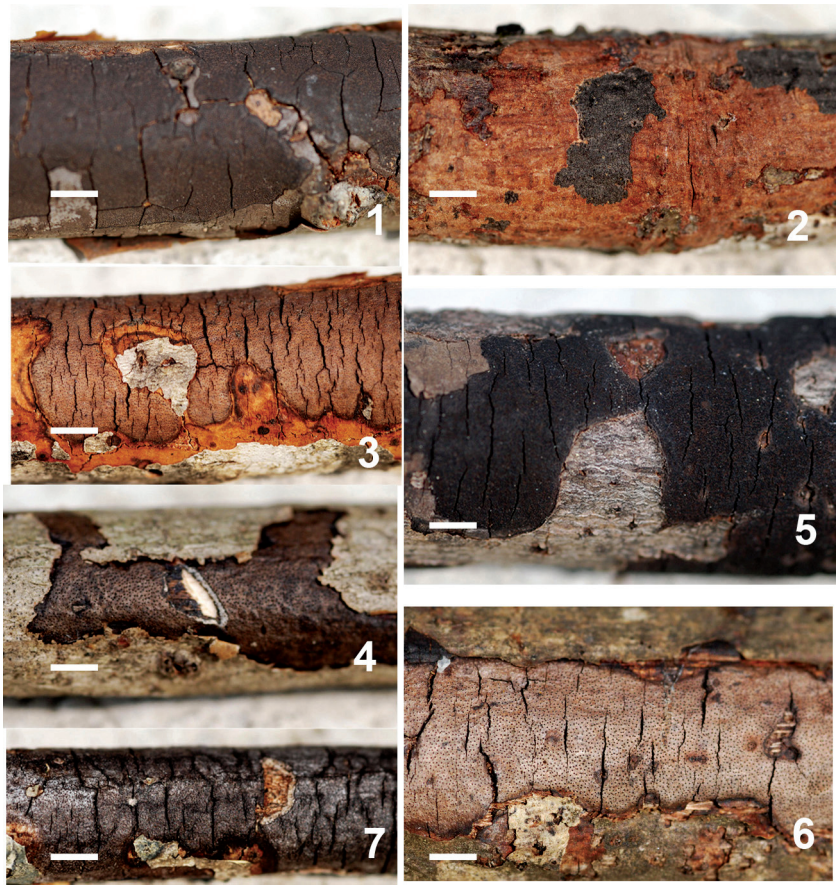
Specimens examined: Arkansas, Ozark Mountains, Ozark Science Center, 22.VI.2006, VLA P-2106; Texas, Big Thicket National Preserve: Big Sandy Creek Unit (Beaver Slide Trail), 2.VIII.2007, VLA P-2111; Loblolly Unit, 3.VIII.2007, VLA P-2112; Turkey Creek Unit (Turkey Creek Trail and Kirby National Trail), 4.VIII.2007, VLA P-2113 and 11.VIII.2007, VLA P-2114; all specimens occurred on dead branches of *Quercus* spp.

Diatrype caryae Lar.N. Vassiljeva & S.L. Stephenson, **sp. nov.** Figs 2, 11
MycoBank MB 512376

Stromata e cortice erumpentia, applanata, circiter 1 mm crassa, late effusa, 'maculae' irregulares fertiles nigrae cum ostioli vadosi discoidei vel punctiformi superficie dispersi et textum sterile cingens pallide brunneum composita. Entostroma atra, perithecia 200–300 µm diam. mono- vel disticha continens, sine zona nigra sub stromatibus. Asci oblongo-saccati, angusti, octospori, p. sp. 28–33 × 4–5 µm, breviter stipitati vel paene sessiles, fascicli minuti formanti, annulo apicali in liquore iodato Melzeri haud cyanescente. Ascosporae hyalinae, rectae vel leviter curvatae, 5–7 µm longae.

Holotype: USA, Texas, Big Thicket Natural Preserve, Turkey Creek Unit, Turkey Creek Trail, on dead branches of *Carya tomentosa* (Poir.) Nutt., 13.VIII.2007, leg. Larissa N. Vasilyeva (VLA P-2115).

Etymology: refers to the genus (*Carya*) of the host plants.



Figs 1–7. Surface of the stromata: 1 - *Diatrype atlantica,* 2 - *Diatrype caryae,* 3 - *Diatrype decorticata,* 4 - *Diatrype ilicina,* 5 - *Diatrype platystoma,* 6 - *Diatrype stigma,* 7 - *Diatrype stigmaoides.*
Scale bars. 1–4 = 4 mm, 5–6 = 2.7 mm, 7 = 3.5 mm.

Stromata erumpent through the bark, flat, about 0.5 mm thick, widely effused and consisting of irregular black fertile patches with shallow discoid or punctiform ostioles scattered at the surface and surrounded by light brown sterile tissue. Entostroma dark with embedded perithecia, these 200–300 µm diam. in one or two layers, without a black stromatic zone beneath stromata. Asci oblong-saccate, narrow, eight-spored, p. sp. 28–33 × 4–5 µm, J-negative, with short stalks, almost sessile in small fascicles. Ascospores hyaline, straight or very slightly curved, 5–7 µm long.

Additional specimens examined: Arkansas, Ozark Mountains, Ozark Science Center, dead branches of *Carya cordiformis* (Wangenh.) Nutt., 21.VI.2006, VLA P-2046; Florida,

Gainesville, bark of *Carya* sp. [Ravenel's Fungi Americani Exsiccati N 359: "*Diatrype stigma*"].

Comments: This species is similar to *Diatrype atlantica* and *D. hypoxyloides* De Not. in having non-sulcate ostioles, but it differs from both of them in having very thin stromata that possess a characteristic coloration of black fertile parts and light brown sterile ones. The epithet 'bicolor' could be applied to them as the species name, but it has already been used for another taxonomic entity (*Diatrype bicolor:* type specimen, K 154358) which has quite a different stromatal habit.

Ravenel's specimen of "*Diatrype stigma*" (Fungi Amer. Exs. N 359) consists of two species (*D. atlantica* on *Quercus* sp. and *D. caryae* on *Carya* sp.).

Diatrype decorticata (Pers.) Rappaz, Mycol. Helvetica 2: 398 (1987) Fig. 3

Stromata erumpent through the bark, irregular, widely effused, pallid-brown or brown, about 0.5 mm thick, with a dark stromatic zone surrounding them. Perithecia in one or two layers, globose, 200–300 µm diam., with sulcate ostioles. Asci clavate, p. sp. 30–40 × 4–6 µm, J-positive, with long stalks up to 35–40 µm long. Ascospores hyaline, allantoid, 6–8 µm long.

Specimens examined: Texas, Big Thicket National Preserve: Big Sandy Creek Unit, (Beaver Slide Trail), 2.VIII.2007, VLA P-2116; Beech Creek Unit (Beech Woods Trail), 9.VIII.2007, VLA P-2117; both specimens on dead branches of *Fagus grandifolia.*

Diatrype ilicina Lar.N. Vassiljeva & S.L. Stephenson, **sp. nov.** Figs 4, 8
MycoBank MB 512377

Stromata e cortice erumpentia in modum placae irregulares stratum extimum cortiale laceratum tenuissimum cirumdatae, late effusa, circiter 1 mm crassa, superficie pallide vel atro brunnea, interdum griseola, cum ostiola depresso stellata. Entostroma alba, perithecia globosa 300–400 µm diam. monodisticha continens, linea nigra margine circumdata. Asci oblongo-saccati, octospori, p. sp. 25–35× 4–6 µm, stipite circiter 15–20 µm suffulti, annulo apicali in liquore iodato Melzeri haud cyanescente. Ascosporae hyalinae, allantoideae, 5–7 µm longae.

Holotype: USA, Texas, Big Thicket Natural Preserve, Lance Rosier Unit, Teel Road, on dead branches of *Ilex vomitoria* Aiton, 6.VIII.2007, leg. Larissa N. Vasilyeva (VLA P-2118).

Etymology: refers to the genus (*Ilex*) of the host plants.

Stromata erumpent through the bark as irregular plates surrounded by scraps of the very thin outermost bark layer, widely effused, about 1 mm thick, surface light to dark brownish or grayish, with low stellate ostioles. Entostroma white with embedded globose perithecia 300–400 µm diam. in one layer, delimited by a thin black line at the margins. Asci oblong-saccate, eight-spored, p. sp. 25–35 × 4–6 µm, J-negative, with stalks about 15–20 µm long. Ascospores hyaline, allantoid, 5–7 µm long.

Additional specimen examined: Arkansas, Ouachita Mountains, Ouachita Mountains Biological Station, dead branches of *Ilex vomitoria* Aiton, 27.VI.2006, VLA P-2119.

Diatrype platystoma (Schwein. : Fr.) Berk., Grevillea 4: 95 (1876) Fig. 5

Stromata erumpent through the bark, widely effused, about 1 mm thick, brown but looking like black velvet due to the tightly crowded, black and discoid ostioles at their surface, with a black stromatic zone in the substrate. Perithecia in one or two layers, globose or compressed, 300–400 µm diam. Asci narrowly-clavate, p. sp. 30–40 × 4–6 µm, J-positive, with short stalks. Ascospores hyaline, allantoid, (5–)7–10 µm long.

Specimen examined: Arkansas, Ozark Mountains, Ozark Science Center, dead branches of *Ostrya virginiana,* 25.VI.2006, VLA P-2107.

Diatrype stigma (Hoffm. : Fr.) Fr., Summa Veget. Scand., p. 385, 1849 Figs 6, 9

Stromata erumpent through the bark, widely effused, about 1 mm thick, surface light brown, with stromatic columns extending into the substrate (as could be seen at the Fig. 9). Perithecia in one or two layers, globose or compressed, 300–500 µm diam., with sulcate ostioles. Asci clavate, p. sp. 30–45 × 5–6 µm, J-positive, with long stalks up to 50–60 µm. Ascospores yellowish, allantoid, 6–10 µm long.

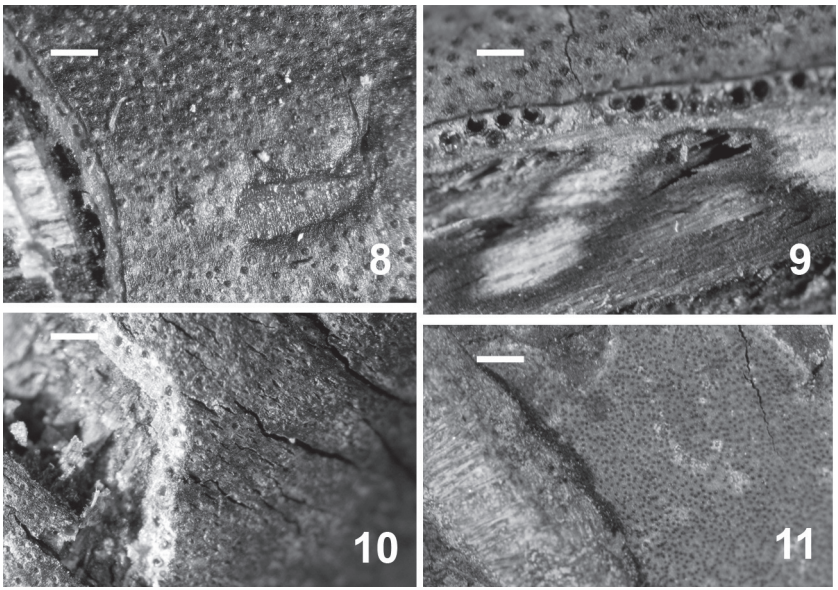
Specimens examined: USA, Arkansas, Ozark Mountains, Ozark Science Center, dead branches of *Carya cordiformis,* 21.VI.2006, VLA P-2108; Ouachita Mountains, Ouachita Mountains Biological Station, dead branches of *Ostrya virginiana,* 25.VI.2006, VLA P-2109; Texas, Big Thicket National Preserve, Turkey Creek Unit, Turkey Creek Trail, dead branches of *Carya* sp., 4.VIII.2007, VLA P-2120.

Comments: This species was also found on *Carya* sp. in the Great Smoky Mountain National Park (Tennessee, Rainbow Falls Trail), but this was not indicated in our previous paper (Vasilyeva & Stephenson 2004).

Diatrype stigmaoides Kauffman, Pap. Michigan Acad. Sci. Art. Lett., 11: 165, 1930 Figs 7, 10

Stromata erumpent through the bark, widely effused, about 0.5–1 mm thick, whitish within, surface grey or dark-grey with a slight luster, without stromatic zone in the substrate. Perithecia in one layer, globose, 400–450 µm diam., with faintly sulcate ostioles. Asci clavate, p. sp. 20–30 × 5–6 µm, J-positive, with long stalks up to 60–70 µm. Ascospores hyaline, allantoid, 4–6 µm long.

Specimens examined: USA, Arkansas, Ozark Mountains, Ozark Science Center, 19.VI.2006, VLA P-2055; Ouachita Mountains, Ouachita Mountains Biological Station, 23.VI.2006 VLA P-2110; Texas, Big Thicket National Preserve, Loblolly Unit, 3.VIII.2007, VLA P-2121; Lance Rosier Unit (Teel Road), 6.VIII.2007, VLA P-2122; Turkey Creek Unit (Kirby National Trail), 11.VIII.2007, VLA P-2123, with all collections on *Quercus* spp.



Figs 8–11. Sections of the stromata: 8 - *Diatrype ilicina,* 9 - *Diatrype stigma,* 10 - *Diatrype stigmaoides,* 11 - *Diatrype caryae.* Scale bars = 0.6 mm.

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